

Appendix F

% TDG Exceedance Tracking System

INTRODUCTION:

The US Army Corps of Engineers (Corps) tracks the number of percent TDG exceedances of the Oregon and Washington water quality standards and designates a cause for each exceedance during the spill season, April 3 through August 31. There are exceedances that occurred outside of the spill season, but they are not included in this report since they are not associated with spill for fish. The State water quality standards are 115% in the forebays and 120% in the tailwaters of the Columbia and Snake River dams, under the provisions of the state water quality exemptions granted by the states. The percent TDG exceedances are based on the daily high 12 hour average, except for those exceedances above 125% which are hourly. This information is provided to the Technical Management Team Regional Forum and can be found at <http://www.nwd-wc.usace.army.mil/tmt/documents/ops/spill/> and also in Appendix E at the end of each monthly court FOP Implementation Report.

Table F-1 provides a listing of the various causes (types) that are designated to each percent TDG exceedance occurrence for the daily high 12 hour average. These definitions of exceedance types have been evolving since 2003; during 2008, the definition of type #12 was changed to show that an exceedance would be credited to a thermal temperature spike of 1.5 °F instead of 3 °F. Table F-2 designates a specific exceedance type for all the exceedances at the Corps Lower Columbia and Snake River projects. Tables F-3A and B provides the total number of each percent TDG exceedance type for each project. Table F-4 provides the maximum hourly % TDG value and number of exceedances, both hourly and daily high 12 hour average, for all the Corps Lower Columbia and Snake River projects plus Chief Joseph at the Middle Columbia River. Table F-5 provides a historical summary from 2001 to 2008 of the number of hours that exceeded the 125% TDG Oregon and Washington state standards during the spill season; Table F-6 breaks down these numbers of exceedances per project for 2008. Table F-7 gives a list of TDG gauges that malfunctioned during the spill season. Plots and Tables for the percent TDG daily high 12 hour averages can be found in Appendix E within the FOP Implementation Reports.

TABLE F-1
TYPES OF PERCENT TDG EXCEEDANCE TRACKING

Types of Exceedances:
1. Exceedance due to high runoff flows and flood control efforts.
2. Exceedance due to Intertie line outages.
3. Exceedance due to unit outages during repair or maintenance.
4. Exceedance due to BPA inability to handle load so water was spilled.
5. Exceedance due to a break down in communication. Teletype went out but no change occurred or Project operator interpreted teletype differently than what was intended.
6. Exceedance due to uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, water temperature effects, spill patterns.
7. Exceedance due to high TDG levels coming from the Mid Columbia River Dam (see Pasco FMS readings).
8. Exceedance due to high TDG levels coming from the Snake River projects (see Ice Harbor Dam FMS readings).
9. Exceedance due to a load rejection; the powerhouse was not working and the river was spilled.
10. Exceedance due to the FMS gage malfunctioning and registering very high TDG levels
11. Exceedance due to mechanical problems, e.g., gate was stuck open, passing debris.
12. Exceedance due to sharp rise in water temperature (a 1.5 degree F. or greater change in a day).
13. Exceedance due to bulk spill pattern being used which generated more TDG than expected.
14. Exceedance due to non-functioning of flow deflectors during tailwater elevation above 19 ft and especially above 26 ft.

TABLE F-2
PERCENT TDG EXCEEDANCE TYPE TRACKING
APRIL 2008

Date	Low Gran. FB	Low Gran. TW	Little Goose FB	Little Goose TW	Low Monu. FB	Low Monu. TW	Ice Harb. FB	Ice Harb. TW	McNary FB	McNary TW	John Day FB	John Day TW	The Dalles FB	The Dalles TW	BON FB	BON TW	Camas FB
4/3/08	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins									
4/4/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/5/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/6/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/7/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/8/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/9/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/10/08	---	---	---	---	---	---	---	---	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins
4/11/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
4/12/08	---	---	---	---	---	---	6	---	---	---	---	---	6	---	---	---	---
4/13/08	---	---	---	---	---	---	6	---	---	---	---	---	6	---	---	---	12
4/14/08	---	---	---	---	---	---	6	---	---	---	---	---	---	---	---	---	---
4/15/08	---	---	---	---	---	---	6	---	---	---	---	---	---	---	---	---	---
4/16/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/17/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/18/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/19/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/20/08	---	---	---	---	---	6	---	---	---	---	---	---	---	---	---	---	---
4/21/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/22/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/23/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/24/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/25/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/26/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/27/08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/28/08	---	---	---	---	6	---	6	---	---	---	---	---	---	---	6	---	6
4/29/08	---	---	---	---	6	---	6	---	---	---	---	---	---	---	---	---	6
4/30/08	---	---	---	---	---	---	6	---	---	---	---	---	---	---	---	---	---

TABLE F-2
PERCENT TDG EXCEEDANCE TYPE TRACKING
MAY 2008

Date	Low Gran. FB	Low Gran. TW	Little Goose FB	Little Goose TW	Low Monu. FB	Low Monu. TW	Ice Harb. FB	Ice Harb. TW	McNary FB	McNary TW	John Day FB	John Day TW	The Dalles FB	The Dalles TW	BON FB	BON TW	Camas FB
5/1/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/2/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/3/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/4/2008	---	---	---	---	13	---	---	---	---	---	---	---	---	---	---	---	12
5/5/2008	---	---	---	---	13	---	13	---	---	---	---	---	---	---	12	---	12
5/6/2008	---	---	---	---	13	---	13	---	---	---	---	---	---	---	---	---	6
5/7/2008	---	---	---	---	6	---	6	---	---	---	---	---	---	---	---	---	---
5/8/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	---
5/9/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6	---
5/10/2008	---	---	---	---	6	---	---	---	---	---	---	---	---	---	---	6	---
5/11/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/12/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---
5/13/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6	---
5/14/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/15/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6	6
5/16/2008	---	---	---	---	---	6	6	---	---	---	---	---	---	---	6	6	6
5/17/2008	---	1	---	---	1	1	1	---	---	---	---	---	---	---	1	1	1
5/18/2008	---	1	---	1	1	1	1	1	---	---	---	---	---	---	1	1	1
5/19/2008	---	1	1	1	1	1	1	1	---	1	---	6	---	---	1	1	1
5/20/2008	---	1	1	1	1	1	1	1	---	1	---	---	---	---	1	1	1
5/21/2008	---	1	1	1	1	1	1	1	---	1	---	---	---	---	---	1	1
5/22/2008	---	1	1	1	1	1	1	1	---	1	---	6	---	---	---	1	1
5/23/2008	---	1	1	1	1	1	1	1	---	1	---	---	---	---	---	1	1
5/24/2008	---	1	1	1	1	1	1	1	---	1	---	1	1	---	1	1	1
5/25/2008	---	1	1	---	1	---	1	1	---	1	---	1	---	---	1	1	1
5/26/2008	---	1	1	---	1	---	1	1	7	1	1	---	---	---	6	1	1
5/27/2008	---	1	1	---	1	---	1	---	7	1	1	---	1	---	---	1	1
5/28/2008	---	1	1	11	1	1	1	1	7	1	1	6	1	---	1	1	1
5/29/2008	---	1	1	1	1	1	1	1	7	1	1	---	---	---	---	1	1
5/30/2008	---	1	1	1	1	1	1	1	---	1	---	---	---	---	1	1	1
5/31/2008	---	1	1	1	1	---	1	1	---	1	---	---	---	---	1	1	1

TABLE F-2
PERCENT TDG EXCEEDANCE TYPE TRACKING
JUNE 2008

Date	Low Gran. FB	Low Gran. TW	Little Goose FB	Little Goose TW	Low Monu. FB	Low Monu. TW	Ice Harb. FB	Ice Harb. TW	McNary FB	McNary TW	John Day FB	John Day TW	The Dalles FB	The Dalles TW	BON FB	BON TW	Camas FB
6/1/2008	---	1	1	1	1	1	1	1	7	1	---	---	---	---	---	1	1
6/2/2008	---	1	1	1	1	1	1	1	---	1	---	---	---	---	---	1	1
6/3/2008	---	1	1	1	1	1	1	1	---	1	---	1	1	1	1	1	1
6/4/2008	---	1	1	1	1	1	1	1	---	1	---	1	1	---	1	1	1
6/5/2008	---	1	1	11	1	1	1	1	---	1	---	---	---	---	1	1	1
6/6/2008	---	1	1	---	1	1	1	1	---	1	---	---	---	---	---	1	1
6/7/2008	---	1	1	---	1	---	---	---	---	---	---	---	---	---	---	1	1
6/8/2008	---	1	---	---	1	---	---	---	---	1	---	---	---	---	---	1	1
6/9/2008	---	1	1	---	1	---	1	---	---	---	---	---	---	---	---	1	1
6/10/2008	---	---	---	---	---	1	---	1	---	---	---	---	---	---	---	1	---
6/11/2008	---	1	---	1	---	1	---	1	---	1	---	1	---	---	---	1	---
6/12/2008	---	1	---	1	1	1	---	---	---	1	---	1	---	---	---	1	1
6/13/2008	---	1	---	1	1	1	1	1	7	1	---	1	---	---	1	1	1
6/14/2008	---	---	1	---	1	1	1	---	7	---	---	---	---	---	---	1	1
6/15/2008	---	---	1	---	1	6	6	---	7	---	1	---	---	---	---	1	1
6/16/2008	---	---	---	---	6	6	6	---	7	---	1	---	6	---	---	1	---
6/17/2008	---	1	---	---	1	---	1	1	---	---	---	---	---	---	---	1	1
6/18/2008	---	1	---	1	1	1	1	1	---	1	---	1	1	---	---	1	1
6/19/2008	---	1	1	1	1	1	1	1	7	1	---	---	1	---	1	1	1
6/20/2008	---	1	1	---	1	1	1	---	7	---	---	---	---	---	1	1	1
6/21/2008	---	1	1	---	1	---	1	1	7	---	1	---	---	---	1	1	1
6/22/2008	---	1	1	---	1	---	1	1	7	---	1	1	1	---	---	1	1
6/23/2008	---	1	1	---	1	1	1	---	---	---	1	---	---	---	---	1	---
6/24/2008	---	1	1	---	1	---	1	1	---	1	---	---	---	---	---	1	---
6/25/2008	---	---	1	---	1	---	1	1	---	---	---	---	---	---	---	1	1
6/26/2008	---	---	1	1	1	---	1	1	---	---	---	---	---	---	---	1	---
6/27/2008	---	---	1	1	1	---	1	---	---	---	---	---	6	---	---	1	1
6/28/2008	---	---	1	---	1	---	1	---	7	---	---	---	6	1	1	1	1
6/29/2008	---	---	1	---	1	---	1	---	7	---	1	---	6	---	1	1	1
6/30/2008	---	---	---	---	1	---	1	---	7	---	1	---	6	---	1	1	1

TABLE F-2
PERCENT TDG EXCEEDANCE TYPE TRACKING
JULY 2008

	Low Gran. FB	Low Gran. TW	Little Goose FB	Little Goose TW	Low Monu. FB	Low Monu. TW	Ice Harb. FB	Ice Harb. TW	McNary FB	McNary TW	John Day FB	John Day TW	The Dalles FB	The Dalles TW	BON FB	BON TW	Camas FB
7/1/2008	---	---	---	---	1	---	6	---	7	---	1	---	6	---	---	1	1
7/2/2008	---	---	---	---	6	---	6	---	7	---	1	---	6	---	1	1	1
7/3/2008	---	---	---	---	6	---	6	---	7	---	1	---	---	---	1	1	1
7/4/2008	---	---	---	---	6	---	6	---	7	---	---	---	---	---	---	1	---
7/5/2008	---	---	---	---	---	---	---	---	7	---	---	---	---	---	---	---	---
7/6/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/7/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/8/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/9/2008	---	---	---	---	---	---	---	---	---	10	---	---	---	---	---	---	6
7/10/2008	---	---	---	---	---	---	---	---	---	10	---	---	---	---	---	---	---
7/11/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/12/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/13/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6	---	6
7/14/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6	---	6
7/15/2008	---	---	---	---	---	10	---	---	---	---	---	---	---	---	---	---	6
7/16/2008	---	---	---	---	---	10	---	---	---	---	---	---	---	---	---	---	---
7/17/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/18/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/19/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/20/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/21/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/22/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/23/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/24/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/25/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/26/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/27/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/28/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
7/29/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/30/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/31/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12

TABLE F-2
PERCENT TDG EXCEEDANCE TYPE TRACKING
AUGUST 2008

	Low Gran. FB	Low Gran. TW	Little Goose FB	Little Goose TW	Low Monu. FB	Low Monu. TW	Ice Harb. FB	Ice Harb. TW	McNary FB	McNary TW	John Day FB	John Day TW	The Dalles FB	The Dalles TW	BON FB	BON TW	Camas FB
8/1/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/2/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/3/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
8/4/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
8/5/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6
8/6/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6
8/7/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
8/8/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/9/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/10/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/11/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6
8/12/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/13/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	---
8/14/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/15/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
8/16/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12
8/17/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6
8/18/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/19/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/20/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/21/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/22/2008	---	---	---	---	---	---	---	---	---	---	---	10	---	---	---	---	---
8/23/2008	---	---	---	---	---	---	---	---	---	---	---	10	---	---	---	---	---
8/24/2008	---	---	---	---	---	---	---	---	---	---	---	10	---	---	---	---	12
8/25/2008	---	---	---	---	---	---	---	---	---	---	---	10	---	---	---	---	---
8/26/2008	---	---	---	---	---	---	---	---	---	---	---	10	---	---	---	---	---
8/27/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/28/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/29/2008	---	---	---	---	---	---	---	10	---	---	---	---	---	---	---	---	12
8/30/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/31/2008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total	0	35	34	23	54	32	55	31	21	28	14	17	17	2	27	57	68
Grand Total	515																

TABLE F-3A
LOWER SNAKE RIVER PERCENT TDG EXCEEDANCE TYPE TOTALS

TDG Exceedance Types	Lower Granite Forbay	Lower Granite Tailwater	Little Goose Forbay	Little Goose Tailwater	Low Monumental forebay	Low Monumental Tailwater	Ice Harbor Forbay	Ice Harbor Tailwater	Totals
1	0	35	34	21	43	26	38	30	227
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	8	4	15	0	27
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	2	0	1	3
11	0	0	0	2	0	0	0	0	2
12	0	0	0	0	0	0	0	0	0
13	0	0	0	0	3	0	2	0	5
14	0	0	0	0	0	0	0	0	0
Grand Total	0	35	34	23	54	32	55	31	264

TABLE F-3B
LOWER COLUMBIA RIVER PERCENT TDG EXCEEDANCE TYPE TOTALS

TDG Exceedance Types	McNary Forbay	McNary Tailwater	John Day Forbay	John Day Tailwater	The Dalles Forbay	The Dalles Tailwater	BON Forbay	BON Tailwater	Camas/ Washougal Forbay	Totals
1	0	26	14	9	8	2	21	49	42	171
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	1	0	1
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	3	9	0	5	5	15	37
7	21	0	0	0	0	0	0	0	0	21
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	2	0	5	0	0	0	1	0	8
11	0	0	0	0	0	0	0	1	0	1
12	0	0	0	0	0	0	1	0	11	12
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
Grand Total	21	28	14	17	17	2	27	57	68	251

TABLE F-4
2008 SPILL SEASON - MAXIMUM %TDG and NUMBER of EXCEEDANCES
Starting April 3, L. Snake R and April 10, L. Columbia R:

Station	APR	MAY	JUN	JUL	AUG
Middle Columbia River					
Chief Joseph Forebay (CHJ)					
Maximum hourly % TDG	107.1	120.4	128.9	118.8	114.2
Number of hours over 110%	0	104	719	744	311
Chief Joseph Tailwater (CHQW)					
Maximum hourly % TDG	119.8	119.3	119.7	118.0	114.7
Number of hours over 110%	19	129	720	740	366
Lower Snake River					
Lower Granite Forebay (LWG)					
Maximum hourly % TDG	105.1	108.6	106.4	105.6	104.3
Number of hours over 115%	0	0	0	0	0
Number of days high 12 hour avg over 115%	0	0	0	0	0
Lower Granite Tailwater (LGNW)					
Maximum hourly % TDG	113.0	134.8	130.5	116.2	113.1
Number of hours over 120%	0	348	445	0	0
Number of days high 12 hour avg over 120%	0	15	20	0	0
Little Goose Forebay (LGSA)					
Maximum hourly % TDG	112.5	126.5	121.9	112.0	113.3
Number of hours over 115%	0	306	458	0	0
Number of days high 12 hour avg over 115%	0	13	21	0	0
Little Goose Tailwater (LGSW)					
Maximum hourly % TDG	119.6	138.6	142.7	134.4	114.7
Number of hours over 120%	0	214	163	2	0
Number of days high 12 hour avg over 120%	0	11	12	0	0
Lower Monumental Forebay (LMNA)					
Maximum hourly % TDG	117.1	130.9	125.8	117.5	112.3
Number of hours over 115%	28	428	635	75	0
Number of days high 12 hour avg over 115%	2	20	28	4	0
Lower Monumental Tailwater (LMNW)					
Maximum hourly % TDG	120.5	128.6	125.9	119.7	117.0
Number of hours over 120%	15	207	249	0	0
Number of days high 12 hour avg over 120%	1	12	17	2	0
Ice Harbor Forebay (IHRA)					
Maximum hourly % TDG	118.5	124.8	121.5	118.5	114.8
Number of hours over 115%	141	422	597	83	0
Number of days high 12 hour avg over 115%	7	19	25	4	0
Ice Harbor Tailwater (IDSW)					
Maximum hourly % TDG	117.0	135.1	124.6	120.0	115.7
Number of hours over 120%	0	250	223	0	0
Number of days high 12 hour avg over 120%	0	13	17	0	1
Lower Columbia River					
McNary Washington Forebay (MCNA)					
Maximum hourly % TDG	110.4	118.6	119.8	118.1	111.9
Number of hours over 115%	0	91	269	106	0
Number of days high 12 hour avg over 115%	0	4	12	5	0
McNary Tailwater (MCPW)					
Maximum hourly % TDG	116.8	123.2	124.2	119.5	118.7
Number of hours over 120%	0	290	272	0	0
Number of days high 12 hour avg over 120%	0	13	13	2	0

TABLE F-4 (continued)
2008 SPILL SEASON - MAXIMUM %TDG and NUMBER of EXCEEDANCES
Starting April 3, L. Snake R and April 10, L. Columbia R:

Station	APR	MAY	JUN	JUL	AUG
Lower Columbia River					
John Day Forebay (JDY)					
Maximum hourly % TDG	109.5	119	118.4	118.0	110.9
Number of hours over 115%	0.0	88.0	120.0	74.0	0.0
Number of days high 12 hour avg over 115%	0	4	7	3	0
John Day Tailwater (JHAW)					
Maximum hourly % TDG	119.8	123.6	126.1	119.5	116.6
Number of hours over 120%	0.0	57.0	80.0	0.0	0.0
Number of days high 12 hour avg over 120%	0	5	7	0	5
The Dalles Forebay (TDA)					
Maximum hourly % TDG	119.1	119.3	119.4	117.2	111.0
Number of hours over 115%	23.0	36.0	104.0	29.0	0.0
Number of days high 12 hour avg over 115%	2	3	10	2	0
The Dalles Tailwater (TDDO)					
Maximum hourly % TDG	118.7	121.4	125.0	119.7	116.3
Number of hours over 120%	0.0	7.0	36.0	0.0	0.0
Number of days high 12 hour avg over 120%	0	0	2	0	0
Bonneville Forebay (BON)					
Maximum hourly % TDG	116.1	118.4	122.0	116.7	113.2
Number of hours over 115%	15.0	206.0	215.0	65.0	0.0
Number of days high 12 hour avg over 115%	1	12	10	4	0
Cascade Island Washington (CCIW)					
Maximum hourly % TDG	120.8	130.0	127.9	123.9	119.3
Number of hours over 120%	3.0	426.0	624.0	71.0	0.0
Number of days high 12 hour avg over 120%	0	22	30	4	0
Camas/Washougal (CWMW)					
Maximum hourly % TDG	118.2	121.5	121.6	117.9	119.3
Number of hours over 115%	72.0	424.0	513.0	137.0	173.0
Number of days high 12 hour avg over 115%	4	20	24	9	11

TABLE F-5
2001 -2008 SPILL SEASON – NUMBER OF HOURS OVER 125% TDG

Year	Number of Hours
2008	668
2007	0
2006	589
2005	0
2004	0
2003	417
2002	85
2001	0

TABLE F-6
2008 SPILL SEASON - NUMBER OF HOURS OVER 125% TDG
Starting April 3, L. Snake R and April 10, L. Columbia R:

Station	Gauge ID	Dates	Range of %TDG	Number of Hours
Chief Joseph Forebay	CHJ	June	125.8 - 128.9	7
Lower Granite Tailwater	LGNW	May	125.2 - 134.8	194
Lower Granite Tailwater	LGNW	June	125.2 - 130.5	88
Little Goose Forebay	LGSA	May	125.1 - 126.5	30
Little Goose Tailwater	LGSW	May	125.1 - 138.6	75
Little Goose Tailwater	LGSW	June	126.9 - 142.7	3
Little Goose Tailwater	LGSW	July	125.1 - 134.4	2
Lower Monumental Forebay	LMNA	May	125.1 - 130.9	116
Lower Monumental Forebay	LMNA	June	125.2 - 125.8	7
Lower Monumental Tailwater	LMNW	May	125.2 - 128.6	38
Lower Monumental Tailwater	LMNW	June	125.1 - 125.9	11
Ice Harbor Tailwater	IDSW	May	125.1 - 135.1	67
John Day Tailwater	JHAW	June	125.2 - 126.1	14
Cascade Island Washington	CCIW	May	125.1 - 130.0	5
Cascade Island Washington	CCIW	June	125.1 - 127.9	11
TOTAL HOURS:				668

TABLE F-7
MALFUNCTIONING TDG GAUGES - 2008

Station	Gauge ID	Dates	Hours with Erroneous Data	Reason for Failed Gauge	Effects on TDG Reading
Lower Monumental Tailwater	LMNW	7/15 - 7/16	1200 - 1100	Punctured membrane	137.0 - 140.3
Ice Harbor Tailwater	IDSW	8/29	0200 - 1100		Very High
McNary Tailwater	MCPW	7/9 - 7/10	0900 - 1100		141.9 - 142.8
John Day Tailwater	JHAW	8/22 - 8/25	1400 - 1200		Very High
Cascade Island	CCIW	8/13 - 8/14	0700 - 0900		*Very High

* Back-up TDG data was recovered and inserted into database to replace high values.

Table F-7 provides additional information on exceedance type #10 in Tables F-2 and F-3, which includes the RAW real-time data. Tables F-4, F-5, and F-6 do not include this erroneous data.